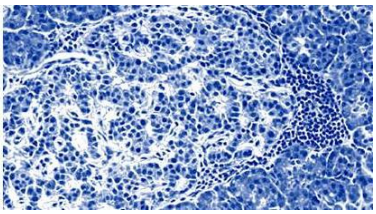
nPOD
Network for Pancreatic Organ Donors with Diabetes



Cellular and Tissue Composition of the Pancreas in Individuals with or at Increased-Risk for Type 1 Diabetes

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PURPOSE

Once thought a disease primarily affecting β-cells, emerging evidence suggests that type 1 diabetes (T1D) affects both the endocrine and exocrine pancreatic compartments. However, a quantitative description of acinar, ductal, and non-endocrine/non-exocrine tissues within the human T1D pancreas is lacking.

METHODS

We utilized HALO image analysis software to analyze scanned whole human pancreas cross-sections from nPOD donor cohort, stained for insulin and glucagon by IHC as well as H&E, from the head, body, and tail regions. We characterized pancreatic exocrine and endocrine tissue compositions by quantifying the proportion of endocrine, acinar, and ductal/other areas as well as acinar and endocrine cell density, and size in subjects with or at-risk for T1D as well as controls without diabetes.

SUMMARY OF RESULTS

In insulin- pancreata with T1D, overall acinar area was reduced, whereas ductal, vessel, fibrotic, adipose and nerve tissue areas were greater in comparison to either non-diabetic group. In contrast, acinar area in insulin+ pancreata from subjects with T1D was similar to both non-diabetic groups; yet, cell size was smaller and cell density was higher in comparison to non-diabetic autoantibody negative individuals. Endocrine tissue area and cells were smaller in T1D pancreata compared to either non-diabetic group. The main

pancreatic duct was thicker and occupied area smaller in the tail vs. body region, independent of disease.

CONCLUSIONS

These data provide novel insights into anatomical differences in T1D pancreata and suggest that while such variations could conceivably precede diagnosis, the loss of residual β cells following onset likely has an influence on the exocrine compartment.